Amendments to the Claims:

On page 1, after the title and before the first paragraph, insert the following heading:

--BACKGROUND OF THE INVENTION--
--1) Field of the Invention--

On page 1, between lines 6 and 7, insert the following heading:

--2) Description of Related Art--

On page 4, between lines 8 and 9, insert the following heading:

--BRIEF SUMMARY OF THE INVENTION--

On page 9 between lines 16 and 17, insert the following heading:

--BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS--

On page 10, between lines 11 and 12, insert the following heading:

--DETAILED DESCRIPTION OF THE INVENTION--

Amendments to the Claims:

1 – 23 Canceled

24. A machining spindle comprising an inner shaft arranged for carrying a first tool for machining a workpiece and an outer shaft arranged for carrying a second tool for machining the workpiece, the shafts being mounted for rotation about a common axis and for axial movement relative to each other, and the machining spindle further comprising a main body within which the shafts are journalled, the inner shaft being mounted within the outer shaft which in turn is journalled by means of an air bearing within the main body and there being an air bearing provided to allow relative axial movement between the inner and outer shafts, wherein the spindle comprises a sensor for sensing when the tools carried by the two shafts contact with a conducting or semi-conducting workpiece, the sensor being arranged to sense a current flowing around a path including the workpiece and the two shafts, and the spindle further comprises a drive transfer member for transferring drive from one shaft to the other so that the first and second shafts rotate in synchrony with one another, the drive transfer member being insulated so that it does not offer an electrical conduction path between the two shafts.

25. A machining spindle according to claim 24 in which the main body comprises jets to provide air to the air bearing allowing relative rotation between the main body and the outer shaft.

26. A machining spindle according to claim 24 in which the inner shaft comprises jets to provide air to the air bearing allowing relative axial movement between the inner and outer shafts.

27. A machining spindle according to claim 24 in which the air bearings are arranged such that air is purged from the spindle at positive pressure, relative to the ambient pressure, at all locations which may be exposed to the by-products of machining operations.

28. A machining spindle according to claim 24 in which at least one supplementary seal is provided.

29. A machining spindle according to claim 24 in which the spindle comprises at least one electric motor for rotatingly driving the shafts.

30. A machining spindle according to claim 24 in which the drive transfer member comprises a pin mounted on one of the shafts and disposed in a recess or an aperture in the other of the shafts such that shafts may move axially relative to one another without interrupting the transfer of drive.

31. A machining spindle according to claim 30 in which the pin is radially mounted.

32. A machining spindle according to claim 31 in which the pin is formed with at least one of an insulating material and an insulating material coating.

33. A machining spindle according to claim 24 in which the spindle comprises an axial drive arrangement for axially driving the shafts relative to one another.

34. A machining spindle according to claim 24 in which an encoding scale is provided to indicate the axial position of at least one of the shafts, which shaft is movable axially relative to the main body.

35. A machining spindle according to claim 24 in which the sensor comprises at least one brush contacting with one of the two shafts.

36. A machining spindle according to claim 24 in which the inner shaft is supported by insulating guide bearings.

37. A machining spindle according to claim 24, said spindle being a dicing spindle for use in dicing semi-conductor wafers, and the shafts each being arranged for supporting a respective cutting wheel.

38. A machining spindle according to claim 24, said spindle being a grinding spindle arranged for supporting grinding tools.

39. A machining apparatus comprising a machining spindle according to claim 24 and a support arrangement for supporting the spindle.

40. A machining apparatus according to claim 39 and further comprising a workpiece table arranged for supporting a workpiece during machining.

41. A method of machining a workpiece comprising the step of using a machining spindle as claimed in claim 24.

42. A method according to claim 41 comprising the step of using the ability to move one shaft axially relative to the other to compensate for one of thermal growth and differences of thermal growth, in at least one component of the spindle as it heats up due to operation.

43. A method of dicing semi-conductor wafers using a machining apparatus comprising a workpiece table for supporting a wafer and a machining spindle comprising an inner shaft carrying a first cutting wheel for machining the wafer, and an outer shaft carrying a second cutting wheel for machining the wafer, wherein the shafts are mounted for rotation about a common axis and for axial movement relative to each other, and the machining spindle comprises a main body within which the shafts are journalled, the inner shaft being mounted within the outer shaft which in turn is journalled by means of an air bearing within the main body, the method comprising the steps of:

cutting along streets in one direction on the wafer, having a first street spacing, using the two cutting wheels set at a first wheel spacing;

moving the shafts supporting the two cutting wheels axially relative to one another to set the cutting wheels at a second wheel spacing; and

cutting along streets in another direction on the wafer, having a second street spacing, using the two cutting wheels set at the second wheel spacing.

44. A machining spindle comprising an inner shaft arranged for carrying a first tool for machining a workpiece and an outer shaft arranged for carrying a second tool for machining the workpiece, the shafts being mounted for rotation about a common axis and for axial movement relative to each other, and the machining spindle further comprising a main body within which the shafts are journalled, the inner shaft being mounted within the outer shaft which in turn is journalled by means of an air bearing within the main body and there being an air bearing provided to allow relative axial movement between the inner and outer shafts, wherein the spindle comprises sensor means for sensing when the tools carried by the two shafts contact with a conducting or semi-conducting workpiece, the sensor means being arranged to sense a current flowing around a path including the workpiece and the two shafts, and the spindle further comprises drive transfer means for transferring drive from one shaft to the other, the drive transfer means being insulated so that it does not offer an electrical conduction path between the two shafts.

45. A machining spindle comprising an inner shaft arranged for carrying a first tool for machining a workpiece and an outer shaft arranged for carrying a second tool for machining the workpiece, the shafts being mounted for rotation about a common axis and for axial movement relative to each other, and the machining spindle further comprising a main body within which the shafts are journalled, the inner shaft being mounted within the outer shaft which in turn is journalled by means of an air bearing within the main body and there being an air bearing provided to allow relative axial movement between the inner and outer shafts, wherein the spindle comprises sensor means for sensing when the tools carried by the two shafts contact with a conducting or semi-conducting workpiece, the sensor means being arranged to sense a current flowing around a path including the workpiece and the two shafts, and the spindle further comprises drive transfer means for transferring drive from one shaft to the other so that the first

and second shafts rotate in synchrony with one another, the drive transfer means being insulated so that it does not offer an electrical conduction path between the two shafts.